Statement of

WILLIAM E. KENNARD
CHAIRMAN
FEDERAL COMMUNICATIONS COMMISSION

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I welcome this opportunity to discuss the potential impact of the Year 2000 problem on the communications industry. I want to commend you, Mr. Chairman, and the Commerce Committee for holding a hearing on this critical issue. As the Year 2000 approaches, it is important that we educate the American public and the international community about the importance of addressing the Year 2000 problem, sometimes referred to as "the Millennium Bug."

Today, I would like to: (1) describe the Year 2000 problem in general and highlight the very serious consequences that could result if the Commission and the communications sector do not adequately address the Year 2000 problem; (2) describe what industry is doing about the problem, and (3) tell you what the FCC is doing to ensure that our Nation's information infrastructure still functions at its full capacity and effectiveness on and after January 1, 2000.

The Problem

I think by now everyone is familiar with the origin of the Year 2000 problem. In the 1950's and 1960's, computer programmers, in order to reduce the need for expensive computer memory, developed the convention of storing dates using only two digits for the year. Thus, 1967 was represented as "67." While many programmers realized that this convention would not work for years after 1999, they assumed that the software they were writing would be obsolete and replaced long before the "Year 2000 Problem" became serious. Unfortunately, they were wrong, and today much of the critical software upon which companies and individuals rely still uses this convention. As a result, it may not function properly in the year 2000. In some cases, the software will continue to function, but it may generate spurious data causing problems that may not be detected for months or even years.

This problem has already been cropping up. Banks have had to correct loan processing software that could not calculate ten-year loans because it couldn't tell the difference between 2003 and 1903. Recently, a merchant sued a credit card company for issuing credit cards with expiration dates in 2000, which his point-of-sale credit card reader could not process.

While most attention has been focused on the problems that will occur on January 1, 2000, it is possible that serious problems will develop next year because some programmers wrote programs that interpreted the year "99" or the date "09-09-99" to mean that the program was to terminate. The consequences of the Year 2000 problem may also last beyond 2000 because the part of a computer program or a computer system affected by the Year 2000 bug might not be used very frequently. Thus, problems might not be detected until months or even years after the start of the year 2000.

Fixing software systems requires programmers to go line-by-line through millions of lines of code to correct the way their software calculates dates. In some cases, computer chips have the Year 2000 problem hard-wired in and will have to be replaced. Many companies are simply replacing their systems with new "Year 2000 compliant" software and hardware. This may be the fastest and most expedient way to address the problem; unfortunately, there is no way to get an

extension on the January 1, 2000 deadline.

The Year 2000 problem has been described by some as the greatest challenge ever to face information system managers. The Gartner Group estimates the total worldwide costs of fixing the problem, including the cost of new upgraded software, will be between $300 and $600 billion. Others have estimated that the costs of lawsuits stemming from disruptions caused by the Year 2000 problem could be at least as much. It is very likely that some companies could go out of business either because of the added expense of dealing with the problem or because they fail to take the necessary steps and lose business as a result.

While the seriousness of the Year 2000 problem has been recognized by computer experts and information system managers for more than 15 years, in most companies only in the last year or two has it been taken seriously at the CEO level. The recent spate of press reports has brought the issue to the attention of the general public.

Communications and the Year 2000 Bug

Because it is very difficult to determine all the ways in which the Year 2000 bug can affect information and computer systems, it is not easy to predict what will happen on January 1, 2000. Companies are still testing their systems and finding new problems. U.S. companies, federal, state, and local governments, and other organizations are working hard to ensure that the Year 2000 problem does not cause major disruptions. What we do know is that every company, every government agency, and every organization that has looked into the problem has found that it is more complicated, more serious, and more costly than originally estimated.

At the FCC, we are very concerned that the Year 2000 problem has the potential of disrupting communications services worldwide. The communications infrastructure is absolutely critical, not only to the economy, including the general commerce, transportation and banking sectors represented on this panel today, but also to national preparedness, military, public safety ,emergency and personal communications.

Every sector of the communications industry -- broadcast, cable, radio, satellite, and wireline and wireless telephony -- could be affected: the United States Emergency Alert System relies on television and radio broadcasts, the transmission of which may be affected by the Year 2000 problem; in some areas of the country, radio, cable and satellite systems are the only sources of up-to-date news and information; and police, fire departments and other emergency personnel rely on radio systems to communicate. We must ensure that all of these forms of communications continue uninterrupted.

All sectors of the global economy, including financial markets, depend upon reliable telecommunications networks to conduct transactions. It therefore is critical that telecommunications networks continue to be able to handle national and international financial transactions. Every night, billions of dollars in financial transactions move across the country and around the world over telecommunications circuits. Any failure to handle that special traffic correctly could cause a major economic disruption. Because global telecommunications rely

upon the seamless interconnection of networks, the international dimensions of the Year 2000 problem are especially significant.

Satellite systems also present a significant concern to us. Satellite systems interface with virtually every aspect of the global economy, including banks, air traffic systems, cable systems, and government systems. Failure to make satellite systems Year 2000 compliant could cause disruptions in a range of day-to-day activities.

Because the entire economy depends upon a reliable communications system, it is critical that each segment of the communications industry adequately addresses the Year 2000 problem. The problem for the industry is complicated because, not only do communications companies have to ensure that their networks, satellite systems, and broadcast facilities work, they also must fix their operations support systems, mission-critical computer systems, and billing systems. And, like any other company, they must ensure that their infrastructures, such as security systems, heating and air conditioning systems, elevators, and payroll systems, are Year 2000 compliant. Given the complexity of the task, it is inevitable that some problems will be overlooked and that some systems will not be fixed before January 1, 2000. The challenge for the communications industry is to fix its major systems so that the Year 2000 problem is, at worst, a nuisance.

Because we cannot know how many of the Year 2000 problems will be fixed by January 1, 2000, it is impossible to make an accurate prediction about what will happen on that date. That will depend entirely upon how well industry deals with the problem -- how much time, attention, money, and staff they devote to fixing their computer and communications systems.

Vital national interests are at stake that warrant the federal government's attention. Americans must be able to call the police, the ambulance, and the fire department in an emergency. And the police, ambulances, fire departments, and other emergency services must have functioning radio systems so they can effectively respond.

Our telephone networks and data networks upon which business and government depend also must continue to work. Recently, we were reminded of just how dependent we are upon telecommunications systems. A telephone carrier suffered a major outage of its frame-relay network, the results of which were instructive as to the types of problems that we would face in an outage situation. Stores throughout the country could not accept credit cards. The American Red Cross had a hard time processing blood donations. The country's largest cable company could not process pay-per-view orders. Millions of dollars in sales were lost. If we have major network outages due to the Year 2000, many small-and medium-sized businesses could find themselves in dire economic straits. Many must rely on only one telecommunications carrier. So if their phone network or their data network goes out, they have to close down. And many small businesses don't have large reserves, so if the problem persists for a few days, they could be out of business.

We must make sure the nation's television and radio stations and cable television systems are ready for the Year 2000. It is not just that millions of Americans might be unable to watch

the Bowl games on New Year's Day, 2000. We need to ensure that the Emergency Alert System works and that Americans have accurate news and information. My biggest concern is not that we may have serious disruptions of our telephone networks and other critical infrastructures. A more likely problem is that people may be so worried and so uninformed about potential problems that they may over-react on January 1 when some systems malfunction, even to a minor degree.

The Industry Response

So what is the industry doing to address this problem? With wireline telecommunications, because the phone companies realize that the Year 2000 problem could disrupt service and adversely affect their bottom lines, they are very motivated to fix the problem. Most companies are devoting significant resources to the problem. They are working with switch manufacturers and other equipment vendors to ensure that software upgrades and new Year 2000 compliant systems are available this year so they can be installed and tested during 1999. Trade associations and industry organizations also are alerting their memberships about the problem, and sharing solutions. This is especially important with regard to smaller companies and individual customers, who should be checking to ensure that their equipment and systems are Year 2000 compliant.

The wireless industry appears to recognize the seriousness of the problem as well. We remain concerned, however, that not enough is being done to ensure that the radio systems used by the police, fire, and other public safety agencies are Year 2000 compliant. Some entities in the wireless industry have made a great deal of progress; others still have a long way to go.

The cable industry also has recognized that it needs to address the problem, and to that end created a working group in February of this year to address Year 2000 issues affecting the cable industry in North America. In addition, we know that major cable equipment manufacturers and several multi-system operators have begun to identify potential solutions to the Year 2000 problem. This is a start. We are particularly concerned about the effect on smaller cable operators, whose equipment may need to be replaced.

America also relies upon global telecommunications networks, which are only as strong as their weakest links. The International Telecommunications Union has created a Year 2000 Task Force to promote international awareness and to provide guidance on Year 2000 readiness. Concerned as we are about our own preparedness, we are also concerned that some countries are far behind us in addressing the problem.

U.S. satellite companies also have adopted remedial measures to address the Year 2000 problem. Some satellite companies in developing countries, however, have not yet taken the necessary steps to prevent system failures, which raises significant concerns.

The Federal Communications Commission's Role

The FCC's primary role is to push the private sector to take responsible action to ensure

that our nation's communications systems will continue to function on and beyond January 1, 2000. It is therefore incumbent upon the FCC to work with the communications industry to ensure that it adequately addresses the Year 2000 problem. That is why we are working with telephone companies, wireless companies, broadcasting and cable TV companies, satellite companies, and others in the communications industry who have responsibility for solving the problem.

But it is clear to everyone that this problem is not like most issues that the FCC must address. The industry and individual communications companies are the only parties who can take the steps necessary to ensure that their networks are Year 2000 compliant. New FCC rules and orders cannot solve the Year 2000 problem. Coordinated private sector action is needed.

Our primary role is to motivate and to facilitate. Let me briefly explain our approach.

First, the FCC is hard at work fixing our own computer systems to make sure they work on and after January 1, 2000. So far, we have requested a total of more than $8 million to upgrade or replace our computer and communications systems to ensure that they are Year 2000 compliant. I believe that the FCC's Office of the Managing Director, which is in charge of our computer systems, is on top of this problem. We are in the middle of a major computer upgrade and, as part of that upgrade, much of the old, non-compliant software is being replaced. We do not have that many computer systems and the ones we have are not as complex as some others. So I'm confident that they will be fixed in time, provided we get the requested funding.

Second, we are working with all segments of the communications industry to ensure that everyone understands the seriousness of the Year 2000 problem and devotes adequate resources to fixing it. Our Year 2000 team has met over the last 10 months, and will continue to meet, with equipment and service suppliers to determine where there are areas in which we can assist. We are taking an active role in the International Telecommunications Union's Year 2000 Task Force, and we also are hosting a series of roundtable discussions to raise awareness and seek solutions to these issues.

We believe that information and cooperation are the keys to addressing the Year 2000 problem. Accordingly, the Commission is encouraging companies to cooperate with each other and with their customers on Year 2000 solutions. Furthermore, we hope to encourage companies to make more information available to the general public. The public needs specific information on how serious the problem is, what is being done to address it, and what they can expect come January 1, 2000.

Thus, we are taking steps to:

1) Ensure that all companies under our jurisdiction are aware of the seriousness of the problem.
2) Monitor how well the communications sector is addressing the problem.
3) Work with other Federal agencies and industry to develop contingency plans to deal with any disruptions caused by the Year 2000 problem.

4) Work with the International Telecommunication Union to help foreign telecommunications companies address the problem so international telecommunications networks are not disrupted.
5) Help telecommunications users get the information and assistance they need from telecommunications companies so they can test and validate that the networks they rely upon will work in the Year 2000.

Each bureau of the FCC is working with companies under their jurisdiction. To coordinate these efforts, in mid-March, we created an internal working group chaired by the Office of Plans and Policy. Attached to my testimony is a summary of what each of the relevant bureaus and offices of the Commission is doing, what our largest concerns are in each sector, and what each sector of the communications industry is doing to deal with the Year 2000 problem. This is not a comprehensive list, and I am happy to report that in the communications industry there are new Year 2000 initiatives being started every week, so this summary will soon be out of date.

Earlier this month, Commissioner Michael Powell, who in his role as Defense Commissioner worries about the reliability and security of our nation's telecommunications networks, agreed to serve as the point man for the Commission's Year 2000 efforts. He is providing the leadership needed to ensure that all the relevant parts of the Commission are focused on this problem. He is also leading our effort to reach out to industry and other parts of the Federal government. In this role, he represents the Commission on the President's Council on Year 2000 Conversion, chaired by John Koskinen, which was created in February and met for the first time earlier this month.

We are working with many other organizations on the Year 2000 problem. In many cases, trade organizations such as the U.S. Telephone Association and CableLabs are helping by alerting their members of the seriousness of the challenge and by sharing information on solutions. We are asking the Network Reliability and Interoperability Council, a private-sector advisory committee to the FCC, to assess the impact of the Year 2000 problem on our nation's networks, to encourage sharing of information on solutions, and to facilitate end-to-end testing of networks.

But in the end, individual companies have the responsibility for addressing this problem. Only they can accurately assess their vulnerabilities and only they can fix their systems.

The FCC has embarked on a three-phase strategy for working with industry on the Year 2000 problem. Phase I has been information gathering. Each of the Commission's bureaus has been monitoring developments and assessing how the Year 2000 problem could impact different sectors of the telecommunications industry.

Using what we have learned in Phase I, we recently started Phase II. We have begun to: (1) publicly highlight the seriousness of the problem, (2) make sure every company under our jurisdiction is taking steps to deal with the problem, and (3) ask for information from industry so

we can assess the progress they are making. Accordingly, Commissioner Powell and I are sending dozens of letters to key companies and industry organizations. Two weeks ago, we launched a new Year 2000 Web site (at http://www.fcc.gov/year2000/) to provide information on the problem and to provide links to other useful sites. We are also reaching out to telecommunications customers to make sure we understand their concerns about the Year 2000. Finally, I welcome this hearing because it provides an excellent forum for us to express publicly the Commission's concerns as well as the need for increased industry action on the problem.

During Phase II, we are also laying the groundwork for Phase III, should it prove necessary. If over the next few months, we find that some sectors of the communications industry either have not answered our inquiries or have given us answers that make clear they are not moving rapidly enough to meet the January 1, 2000 deadline, then we will have to take more rigorous action. What that would entail will vary with the sector and with the amount of regulatory authority we have other it.

Conclusion

As you can see from the attached summary of FCC and industry activities, a lot of people in many different places are working on this problem. As I said earlier, especially in the last two years, the CEOs of almost all U.S. communications companies have come to realize that the Year 2000 problem is more than just an arcane technical problem. It is a potential crisis. But rest assured that my fellow Commissioners and I -- and the staff of the Commission -- take the Year 2000 problem very seriously, and we will do all we can to encourage the private sector to meet the Year 2000 challenge. It is our challenge, as well, to ensure the integrity and continued operations of our Nation's communications networks.

We look forward to working with the Commerce Committee on this problem in the months ahead and welcome your questions.

Attachment

OVERVIEW OF THE YEAR 2000 PROBLEM IN THE COMMUNICATIONS SECTOR: CONCERNS AND ACTIONS

Common Carrier Bureau

Biggest concerns:

- Upgrading network switches (although manufacturers are on schedule to provide fixes).
- Upgrading Customer Premises Equipment(CPE), voice mail systems, Private Branch Exchanges(PBXs), ensuring interoperability with the network.
- Ensuring telephone companies(telcos) cooperate fully with major customers on Year 2000 testing.
- Ensuring small telcos have the resources and expertise needed to fix the problem.
- Dealing with billing and other internal systems.

What the FCC is doing:

- Meeting with telcos, the U.S. Telephone Association, switch manufacturers, and banks and other major users.
- Writing major telcos, equipment manufacturers, trade associations, and Bellcore.
- Planning public forums with testimony from telcos, equipment manufacturers, and users.
- Developing options to require detailed reports on Year 2000 compliance, if necessary.
- Sharing information with other Federal agencies.

What industry is doing:

- Bellcore is providing expertise, leadership, and technical standards for Year 2000 compliance.
- Ten regional telcos have formed the Telco Year 2000 Forum to share information.
- U.S. Telephone Association sent out an advisory to its members in mid-1997.

Cable Services Bureau

Biggest concerns:

- Power system failures could disrupt cable service, including the cable system's emergency alerting system messages.
- Billing systems could generate faulty data.
- Satellite telecommunications links could be disabled.

What the FCC is doing:

- Writing to major cable TV companies and trade associations.
- E-mailed questions on Year 2000 problems in cable systems to more than 1000 cable engineers.
- Talking to CableLabs, a consortium of cable companies.

What industry is doing:

- CableLabs has formed a Year 2000 working group.

Mass Media Bureau

Biggest concerns:

- Emergency Alert System may fail just when it is needed most.
- Lack of broadcast news may result in misinformation and mass panic.
- Old transmitters and other systems may be hard to test or fix.

What the FCC is doing:

- Speaking out on Year 2000 issues at National Association of Broadcasters(NAB) convention and other forums.
- Writing to broadcasters and trade associations.
- Planning to meet with broadcasters and equipment manufacturers.

What industry is doing:

- NAB has created a Web site on Year 2000 issues and selected a Vice President to focus on issue.

Wireless Telecommunications Bureau

Biggest concerns:

- Radios for police, fire, and other emergency services could fail due to Year 2000 problems. Many of these systems are quite old and manufacturers may not be able to provide fixes for all of them.
- Wireless systems could fail, just when they might be needed as backup to

wireline telephones.

What the FCC is doing:

- Writing the major wireless companies, equipment manufacturers, and trade associations.
- Meeting with representatives of different part of the wireless industry to assess their efforts.
- Planning a forum on the Year 2000 and the wireless industry.
- Considering options to condition licenses, renewals, and auctions on Year 2000 compliance.

What industry is doing:

- The public response of the wireless industry to the Year 2000 problem has been uneven, although several manufacturers and large companies are working on the problem.

International Bureau

Biggest concerns:

- Whether foreign telecommunications companies, especially large segments of the developing world, will be able to provide service on January 1, 2000. This could have a huge impact on international trade, foreign investment, the global economy, and even national security.
- Whether satellite links are Year 2000 compliant.

What the FCC is doing:

- Writing to international telecommunications companies and satellite and HF service providers.
- Will publish letters in industry publications and ITU publications.
- Working with the International Telecommunications Union to educate and motivate foreign telephone companies.
- Planning public forums with international telecommunications carriers.
- Planning a public forum with satellite companies.
- Speaking out about the Year 2000 problem at international telecommunications meetings.

What industry is doing:

- Telecommunications companies are working hard to fix Year 2000 problems.
- Satellite companies have set up "war rooms" to deal with the Year 2000 problems.

- Every U.S. telecommunications company has established an office for Year 2000 compliance.
- Several countries, including the United Kingdom, Canada, and Australia have high-profile efforts under way to tackle the Year 2000 bug, and their telecommunications companies (e.g. British Telecom) are working with foreign partners on the problem.
- In many foreign countries, particularly in Asia and Africa, telecommunications companies are only now becoming aware of the Year 2000 problem and they lack the resources to fully address it.

Compliance and Information Bureau

Biggest concerns:

- Ensuring that internal database systems and equipment used by the Bureau for enforcement purposes is Year 2000 compliant.
- Preparing the National Call Center to collect data and respond to inquiries relating to Year 2000.

What we're doing:

- Checking CIB database software and computers used in the enforcement program, such as mobile and fixed direction finding systems, Global Positioning System(GPS) receivers and the software used to operate these systems.
- Preparing to collect data regarding calls received by the National Call Center and to provide information to the Call Center personnel from other Bureaus and Offices to use in responding to incoming Year 2000 calls.

Office of Engineering and Technology

Biggest concerns:

- Telecommunications equipment testing labs may close down or generate faulty data due to Year 2000 problems.

What the FCC is doing:

- Sending letters to testing labs.
- Directing the Network Reliability and Interoperability Council to focus on Year 2000 issues and facilitate Year 2000 testing telecommunications networks.
- Coordinating construction of the FCC's new Year 2000 Web site.

Office of the General Counsel

What the FCC is doing:

- Reaching out to the Communications Bar to increase their awareness of Year 2000 issues and urge them to press telcos to increase their efforts to address the problem.

Office of Plans and Policy

What the FCC is doing:

- Coordinating the FCC's efforts to work with industry on Year 2000 issues.
- Examining whether the Internet will be affected by Year 2000 problems.
- Contacting Internet organizations and Internet equipment vendors.